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Introduction: Law, Technology, and Energy in Pittsburgh

Jeffrey Roberts & Matthew Brouse*

In recent years, Pittsburgh has emerged as the primary center for American Energy. In addition to housing everyday energy brands such as Westinghouse Electric Co., U.S. Steel, and Alcoa, Pittsburgh has one of North America's largest reserves of natural gas.¹ Pittsburgh has also become a leader in the development of energy technology related to coal; natural gas; nuclear, solar, and wind power; energy storage; and sustainable building design.² The combination of Pittsburgh's strong and thriving energy industry combined with such an enthusiastic approach for innovation and technological development has led to a new era of coal and gas technology, resulting in the creation of jobs, viable economic growth, development of new technologies, and a sustainable domestic energy supply.³

Pittsburgh's Energy Industry has become a catalyst for economic development through the direct creation of jobs within the energy sector.⁴ According to the U.S. Bureau of Labor Statistics, throughout 2012, the Pittsburgh

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¹ Ron Starnier, *The New Center of American Energy*, SITE SELECTION, Sept. 2012, available at <http://www.siteselection.com/issues/2012/sep/pittsburgh.cfm>.

² *Id.*

³ See Tim Mullaney, *Want a Job? Look to the Energy Field*, USA TODAY (Oct. 5, 2012, 10:17 AM), <http://www.usatoday.com/story/money/business/2012/09/30/energy-jobs-growing/1598801/>.

⁴ Phil Cynar, *Wall Street Journal Reports on Pittsburgh, the "Energy Revolution," and Manufacturing's Rebirth*, IMAGINE PITTSBURGH (Oct. 24, 2012), <http://imaginepittsburgh.com/now/wall-street-journal-102412/18540/>.

Energy Industry employed more than 44,600 people.⁵ As Pittsburgh's Energy Industry continues to expand, energy companies require increased numbers of trained, knowledgeable, and experienced energy workers.⁶ Many educational institutions in Pennsylvania, ranging from grade schools to public universities, have already sought to address this need by establishing new energy curriculum, building energy-training centers, and incorporating energy issues into current training models.⁷ For example, the Pittsburgh Technical Institute, University of Pittsburgh School of Law, Carnegie Mellon University, and the Blackhawk School District, have all instituted new energy curriculums, several with a specific focus on the oil and gas industry.⁸

Recent data from the Allegheny Conference on Economic Development shows that Pittsburgh's Energy Industry makes up close to 16% of the region's economy.⁹ Core energy industries or those industries performing oil and gas drilling and exploration, coal mining, and power generation; paid out nearly \$3.6 billion in wages in 2012 alone.¹⁰ Ultimately, Pittsburgh's Energy Industry has had a direct economic impact on Southwestern Pennsylvania in an amount over \$19 billion.¹¹ That impact is only likely to further intensify as many energy companies increase staffing and expand geographically.¹²

Economically, Pittsburgh's Energy Industry has indirectly benefitted Pennsylvania residents such as farmers, landowners, businesses, and local

⁵ Jim Futrell, *Energy Industry Continues to Grow*, PITTSBURGH REGIONAL ALLIANCE (Oct. 10, 2013, 12:00 PM), <http://blog.pittsburghregion.org/energy-industry-continues-to-grow/261/>.

⁶ See generally Anja Litvak, *Pittsburgh Technical Institute Transforms itself with New Energy Curriculum*, PITTSBURGH POST-GAZETTE (Nov. 5, 2013, 10:59 AM), <http://www.post-gazette.com/business/2013/11/06/Piece-by-piece-PTI-completing-vision/stories/201311060089> (discussing how institutes in the Pittsburgh area have initiated new energy training programs and curriculum in order to meet the needs of energy companies' growing demands).

⁷ See, e.g., *id.*

⁸ See *University of Pittsburgh School of Law 2013 Energy Law & Policy Institute*, PITTLAW, <http://www.law.pitt.edu/events/2013/08/university-of-pittsburgh-school-of-law-2013-energy-law-policy-institute> (last visited Nov. 25, 2013); see also Anya Litvak, *Oil and Gas Industry Drafts Lesson Plans*, PITTSBURGH POST-GAZETTE (Sept. 4, 2013, 4:00 AM), <http://www.post-gazette.com/businessnews/2013/09/04/Oil-and-gas-industry-drafts-lesson-plans/stories/201309040193>.

⁹ Anya Litvak, *Pittsburgh's Energy Industry Maintains Growth Spurt Despite Challenges*, PITTSBURGH BUS. TIMES (Nov. 30, 2012, 5:00 AM), <http://www.bizjournals.com/dallas/print-edition/2012/11/30/pittsburghs-energy-industry-maintains.html>.

¹⁰ *Id.*

¹¹ *Id.* (defining a direct economic as payments of wages, taxes, and dividends, and the distribution of philanthropic grants and cash contributions).

¹² *Id.* (stating that recent study showed many energy companies planned to add over 7,000 positions by 2020).

governments.¹³ For example, the Pittsburgh International Airport, which recently entered into an oil and gas lease with Consol Energy, expects to receive around \$450 million in royalties for natural gas extracted from beneath Airport property.¹⁴ The additional capital for the Airport will directly improve the airport's bottom line while also permitting capital investment.¹⁵ In another comparable example, Pennsylvania townships, such as Chartiers Township, have reported receiving large impact fees and tax revenues from oil and gas industry operations in the Pennsylvania region.¹⁶ Impact fees given to townships and localities benefit local communities by supporting statewide programs, funding educational opportunities, and assisting governmental agencies.¹⁷ The realization of economic benefits from the oil and gas industry will likely only proliferate as more Pennsylvania communities permit oil and gas drilling operations on both public and private property.¹⁸

Pittsburgh's Energy Industry has also indirectly reinvigorated manufacturing efforts in Pennsylvania, Ohio, and West Virginia.¹⁹ Even though the 2008 recession

¹³ Kevin Begos, *Corbett: Critics of Drilling Downplay Benefits*, OBSERVER REP. (Nov. 14, 2013, 10:46 PM), <http://www.observer-reporter.com/article/20131114/NEWS04/131119599#.Uofy5GRgY9w>.

¹⁴ Michael Bradwell, *Panelists Discuss Economic Impact of Marcellus*, OBSERVER REP. (Nov. 15, 2013, 11:33 PM), <http://www.observer-reporter.com/article/20131114/NEWS01/131119602#.Uof0t2RgY9w>.

¹⁵ *Id.*

¹⁶ *Id.* (Jodi Noble, the manager for the Chartiers Township, reported receiving \$1.1 million in fees over the past two years following the enactment of Act 13).

¹⁷ See generally *Safe Natural Gas Development Benefits Cascade Across Pennsylvania*, MARCELLUS SHALE COALITION (June 14, 2013, 12:00 PM), <http://marcelluscoalition.org/2013/06/safe-natural-gas-development-benefits-cascade-across-pa/>; see, e.g., Meredith Fahey, *ShaleNET helps place 2,646 Workers in Family Supporting Jobs*, IMAGINE PITTSBURGH, <http://imaginepittsburgh.com/now/tag/marcellus-shale/> (last visited Nov. 18, 2013).

¹⁸ Following the recent Pennsylvania Supreme Court Decision on Act 13, a state law which permitted oil and gas law to overrule local zoning restrictions, local zoning laws will now control where oil and gas drilling operations can occur. While some local zoning laws may limit the spread of drilling operations into some residential areas, some municipalities may adjust zoning laws to permit an influx of local drilling. Don Hopey, *Pennsylvania Supreme Court declares portions of shale-drilling law unconstitutional*, PITTSBURGH POST-GAZETTE (Dec. 20, 2013, 12:03 AM), <http://www.post-gazette.com/local/2013/12/19/Pennsylvania-Supreme-Court-declares-portions-of-shale-drilling-law-unconstitutional/stories/201312190254#ixzz2o9Nf9sc2>. For example, Allegheny County officials have requested proposals for natural gas drilling under Deer Lake Park, which could bring in \$700,000 in annual royalties and a one time signing bonus of \$2 to \$4 million dollars. Associated Press, *Allegheny County, Pa. Seeks Gas Drilling Beds*, SHALEREPORT (June 19, 2013, 10:00 AM), http://www.shalereporter.com/government/article_9d20649e-d8e1-11e2-92b6-001a4bcf6878.html.

¹⁹ See, e.g., Natasha Alperowicz, *Engineering & Construction: Shale Boom Reinvigorates the Industry, Could Lead to Shortage of Labor Resources*, IHS CHEMICAL WEEK (June 10, 2013, 12:43 PM), <http://www.chemweek.com/lab/Engineering-and-construction-Shale-boom-reinvigorates->

resulted in Pittsburgh losing 11,600 manufacturing jobs, Pittsburgh has seen one of the fastest job growth rates in the country.²⁰ With an abundance of cheap shale gas, large manufacturing companies have once again been able to invest capital in the development of new facilities and mills.²¹ Industries that are specifically dependent on natural gas as a chemical feedstock in the manufacturing process now have the opportunity to obtain natural gas from shale gas developments in the U.S., which permits not only a reduction in product pricing but also a competitive advantage in product development.²² For example, Vallourec Star, The Timken Co., and U.S. Steel Corp., are just several of the large U.S. manufacturing companies to use funds available from U.S. natural gas and oil drilling to build or reinvigorate new facilities.²³ Foxconn, one of the largest global manufacturers of devices for Apple, also plans to take advantage of Pennsylvania's affordable energy resources and has announced plans to launch a manufacturing plant in Harrisburg, Pennsylvania.²⁴ Ultimately, the reinvigoration of these manufacturing efforts is expected to add several thousand new jobs in the Pittsburgh region.²⁵

Pittsburgh's Energy Industry is helping to advance America's energy security by developing emerging energy technologies and domestic energy resources. This development has and will continue to assist the U.S. in decreasing its dependency on oil and natural gas imports.²⁶ Pennsylvania, along with several other states, have

the-industry-could-lead-to-shortage-of-labor-resources_52648.html (discussing how cheap shale gas has permitted investment in industries ranging from petrochemicals to plastics, all around the world).

²⁰ Harold D. Miller, *Pittsburgh's Job Growth Isn't Helping the Unemployed*, PITTSBURGH'S FUTURE (Sept. 2, 2012, 12:00 PM), <http://www.pittsburghfuture.blogspot.com/2012/09/pittsburghs-job-growth-isnt-helping.html>.

²¹ Bob McCutcheon, *Resurgence in US Manufacturing: Transportation and Costs—Shale Gas*, PWC (Aug. 12, 2013), <http://usblogs.pwc.com/industrialinsights/pwc-blog-for-industrial-products-companies-2/>.

²² *Booming Natural Shale Gas Industry Key to U.S. Manufacturing Resurgence*, GRAY (Mar. 20, 2013), <http://www.gray.com/news/blog/2013/03/20/booming-natural-shale-gas-industry-key-us-manufacturing-resurgence>.

²³ *Id.*

²⁴ Roland Hutchinson, *FoxConn To Launch Manufacturing Plan in the US*, TECH. NEWS (Nov. 25, 2013, 10:00 AM), <http://www.geeky-gadgets.com/foxconn-to-launch-manufacturing-plant-in-the-us/>; see also Scott Andes, *Foxconn Sends a Manufacturing Message with New Pennsylvania Plant*, THE AVENUE (Nov. 25, 2013, 4:39 PM), <http://www.brookings.edu/blogs/the-avenue/posts/2013/11/25-foxconn-pennsylvania-muro-andes>.

²⁵ *Id.*

²⁶ See Keith Carls, *Domestic Energy Boom Helping Gas Prices Fall*, CENTRAL COAST NEWS (Nov. 15, 2013, 6:56 PM), <http://www.kcoy.com/story/23984431/domestic-energy-boom-helping-gas-prices-fall> (reporting that the U.S. Energy Department has released information showing that the U.S. has for the first time produced more oil and natural gas than it has imported).

increased domestic shale-gas production so much that natural gas output in the U.S. has increased by 20% in the past five years.²⁷ The increase in shale gas output has not only ensured that the U.S. has claim to the title of the world's largest gas producer, but has also ensured that Americans can obtain gas and electricity for prices well below international standards.²⁸ While the shale-oil boom has not reduced global oil prices significantly, it has drastically decreased America's importation bill.²⁹ Some economists have even estimated that America's production of shale gas has reduced the trade deficit by close to \$70 billion, or around 10% in 2012 alone.³⁰

By maintaining or even increasing natural gas production, the U.S. can ensure that an affordable and abundant supply of energy is available to meet growing energy demands.³¹ The U.S. Energy Information Administration reports that not only will energy consumption continue to increase by 56% by 2040, but global natural gas consumption will also increase by 1.7% each year until 2040.³² Ultimately the global demand for energy will require that fossil fuels, such as oil and natural gas, continue to supply almost 80% of global energy use for the foreseeable future.³³ The American shale gas boom, which has resulted in an increase in U.S. oil production at exceedingly fast rates, if sustained will ensure that the U.S. is equipped with the ability to meet a large majority of these energy demands.³⁴

²⁷ *Deep Sigh of Relief*, THE ECONOMIST (Mar. 16, 2013, 12:00 PM), <http://www.economist.com/news/special-report/21573279-shale-gas-and-oil-bonanza-transforming-americas-energy-outlook-and-boosting-its>.

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.*

³¹ *#1 U.S. Positioned to be World's Top Oil, Natural Gas Producer*, MARCELLUS SHALE COALITION (Oct. 4, 2013), <http://marcelluscoalition.org/2013/10/1-u-s-positioned-to-be-worlds-top-oil-natural-gas-producer/>.

³² Don Smith & Rebecca Watson, *Oil and Gas Development is Key to US Future. Don't Ban It. Regulate It*, THE CHRISTIAN SCIENCE MONITOR (Oct. 23, 2013, 12:00 PM), <http://www.csmonitor.com/Commentary/Opinion/2013/1023/Oil-and-gas-development-is-key-to-US-future.-Don-t-ban-it.-Regulate-it>.

³³ *Id.* (stating that fossil fuels will need to supply global energy demands until 2040).

³⁴ Derek Scissors, *The U.S. Has a Huge Advantage over China in Energy—and It's Growing*, THE ATLANTIC (Oct. 1, 2013, 10:39 AM), <http://www.theatlantic.com/china/archive/2013/10/the-us-has-a-huge-advantage-over-china-in-energy-and-its-growing/280134/> (stating that "The Energy Information Administration forecasts that daily oil production in the U.S. will reach three times that of China's next year, and the gap is widening: American energy production is now growing four to five times faster than Chinese output. At this rate, the U.S. will produce four times as much oil as China by the end of the decade").

Marcellus shale operations, which consist of both hydraulic fracturing and horizontal drilling, are safe, proven technologies that have played a critical role in both the Oil and Gas Industry and the Energy Industry as a whole.³⁵ To ensure that oil and gas operations are safe and effective, many Marcellus shale operators have enacted strong health and safety programs, required mandatory safety training, and instituted strong engineering controls to limit health risks and exposures.³⁶ These efforts have resulted in the Oil and Gas Industry having an overall improved safety rating with declining fatality rates and reduced workplace accidents.³⁷ The Industry's injury rate, 0.8 cases per 100 workers, is not only well below the national average but also particularly impressive given that the industry has significantly expanded operations.³⁸

While oil and gas operations face some environmental challenges, emerging technologies in modern shale gas development, have managed and overcome many of these concerns.³⁹ By following industry best practices and continuously improving technological capabilities, modern shale development has ensured effective land management, reduction in air emissions, effective water treatment to protect the groundwater table, and significant reduction in surface disturbances and associated impacts to wildlife, dust, noise, and traffic.⁴⁰

Because there is an ongoing debate surrounding the environmental and societal impacts of the energy industry, issues involving energy law and technology are often comingled in controversy. The articles included in this student written series therefore address a wide spectrum of energy technology and related legal issues, including:

- The historical development of energy resources in the Pittsburgh Region;

³⁵ Mark Green, *A Move for Effective and Efficient Fracking Regulation*, ENERGY TOMORROW BLOG (Nov. 21, 2013, 12:00 PM), <http://www.energytomorrow.org/blog/2013/november/a-move-for-effective-and-efficient-fracking-regulation>.

³⁶ Mallia Spencer, *7 Signs of a Safety Culture in the Marcellus Shale (Video)*, PITTSBURGH BUS. TIMES (Oct. 1, 2013, 10:45 AM), <http://www.bizjournals.com/pittsburgh/blog/energy/2013/10/safety-in-the-marcellus-and-7-signs-of.html>.

³⁷ John Krohn, *Actual Data Tell Very Different (and very good) Story on Worker Safety*, ENERGY IN DEPTH (Feb. 27, 2013, 12:12 PM), <http://energyindepth.org/marcellus/actual-data-tell-very-different-and-very-good-story-on-worker-safety-2/>.

³⁸ *Id.*

³⁹ Northeast Gas Association, *Brief Marcellus Shale*, NGA, Oct. 2013, available at http://www.northeastgas.org/marcellus_shale.php.

⁴⁰ *Id.*

- The challenges posed to the Energy Industry through potential environmental and socioeconomic impacts;
- Emerging technology in the Energy Industry;
- The problems posed by current energy regulations; and
- Proposals for regulatory reform to permit technological development in the energy field.

While we do not endorse the views or opinions expressed in the student article series, the articles recognize the important role Pittsburgh's Energy Industry has played in building the economy and driving technological development, while also noting the significant challenges and potential innovations faced by Pittsburgh's Energy Industry in the future.